

Hanford Update

U.S. Department of Energy - Washington State Department of Ecology - U.S. Environmental Protection Agency

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Hanford Happenings

Comment Periods:

Hanford Site Air Operating Permit Changes
June 11 - July 13, 2007

Setting New Air Quality Standards in Hanford's Tank Farms
June 25 - July 25, 2007

Public Hearing:

Hanford Site Air Operating Permit changes
5:00pm Thursday, July 12, 2007
Department of Ecology Richland Office
3100 Port of Benton Blvd

September 6-7, 2007

Hanford Advisory Board Meeting
(509)372-8656, Seattle Public Library, 1000 4th Ave. Seattle, WA



Plutonium Finishing Plant (PFP) 241-Z Liquid Waste Treatment Facility Demolished

Workers finished demolishing the 241-Z Liquid Waste Treatment Facility at PFP and completed removing rubble and stabilizing the site. Victory was declared June 8. Demolishing the facility met Tri-Party Agreement (TPA) milestone M-083-42 — complete transition and dismantlement of 241-Z Waste Treatment Facility by Sept. 30, 2011. The milestone was met four years and four months early. In addition to demolishing the 241-Z Facility itself, two small ancillary structures were torn down — Building 241-ZA and Caustic Load Facility 241-ZB.

Demolishing the 241-Z facility, removing rubble and stabilizing the site took exactly six weeks from start to finish. It generated 24 Environmental Restoration Disposal Facility (ERDF) containers of low-level debris, just over half the 42 containers generated by demolishing

the 232-Z Facility. The concrete slab floor of the facility was sealed, covered with a robust polyurea membrane, and then overlaid with approximately two-to-three inches of gravel. Planning to clean out the 241-Z Facility began five

the Cold War, the “D” tanks in the below-grade vaults collected liquid wastes — acids and corrosive chemicals contaminated with plutonium — from plutonium finishing operations. Radiological waste from PFP process

Most of the waste generated in cleaning out the 241-Z tanks and vaults was transuranic (TRU), and will be shipped to the Waste Isolation Pilot Plant in New Mexico. TRU waste contains more than 100 nanocuries per gram of alpha-emitting TRU

isotopes with half-lives greater than 20 years.

Transuranic isotopes are those higher than uranium on the Periodic Table of the Elements. A nanocurie is a unit of radioactivity one-billionth of a curie. To support D&D activities in open air, the tanks and vaults themselves had to be cleaned to much lower waste levels



The 241-Z Facility team in front of the clean demolition site.

years ago. Physical remediation work on five highly contaminated vaults and tanks under the facility began in November 2005.

The 241-Z Facility was part of the original PFP construction during 1947-49; however, the above-ground portion of the building was erected in the early 1980s. Throughout

buildings drained via underground lines into large steel pipes that ran through tunnels under the main 234-5Z Building into the 241-Z system. After being sampled and neutralized, the wastes were pumped or jetted to disposal. The 241-Z Facility made its last transfer to Hanford's tank farms in November 2004.

established as part of regulatory end points for the PFP complex.

To view a demolition video about cleaning out 241-Z, go to www.hanford.gov, then click on Videos on the left side of the screen, and then click on “241-Z Cleanout Work Evolution.”

DOE to Conduct Natural Resource Damage Assessment Process at Hanford

The federal Departments of Energy (DOE), Commerce, and the Interior announced plans to conduct a phased Natural Resource Damage Assessment (NRDA) process at the Hanford Site in eastern Washington to further cleanup and restoration of the site. DOE, as the lead response agency and a federal natural resource trustee for the Hanford Site, will lead the assessments in parallel with ongoing ecological risk assessments under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The NRDA process will evaluate whether there have been any adverse effects on natural resources as a result of releases of CERCLA hazardous substances at the 586-square-mile site.

DOE will build on the extensive environmental-monitoring program, which has produced thousands of ecological and environmental studies over more than 60 years, to assess whether there have

been any effects on natural resources from Hanford releases.

DOE will conduct the assessments in collaboration with the Hanford natural resource trustees that include U.S. DOE, the Departments of Commerce and the Interior, the states of Washington and Oregon, the Confederated Tribes and Bands of the Yakama Indian Nation, the Confederated Tribes of the Umatilla Indian Reservation, and the Nez Perce Tribe.

To the extent practicable, the Hanford-phased NRDA will be integrated into DOE's ongoing cleanup actions at Hanford. DOE expects to carry out both the cleanup and NRDA process within its existing budget request.

The phased NRDA process could include identifying gaps in existing data, designing additional studies if necessary, developing a conceptual site model showing where contamination exists, and drafting an assessment plan

for potentially affected natural resources. If the assessment finds that natural resource injuries have resulted from Hanford CERCLA releases, future cleanup actions may be designed to achieve restoration of the natural resources affected.

Designing cleanup actions to achieve both cleanup and restoration goals will allow DOE to identify and begin reducing potential natural resources impacts sooner.

The concept of natural resource trustees is derived from a legal principle that federal, state and tribal governments hold certain property and natural resources in trust for the benefit of the public and that those governments have the duty and authority to protect and preserve such property and resources for public uses. Through this NRDA process, trustees may determine the nature and extent of injuries to natural resources from covered releases, and develop strategies to restore any natural resources affected if necessary.



Demonstration Bulk Vitrification System (DBVS)

The U.S. Department of Energy's Office of River Protection (ORP) received an additional \$3 million in Fiscal Year 2007 to support the Demonstration Bulk Vitrification System (DBVS). DBVS is under evaluation as a potential supplemental treatment technology for some of Hanford's low-activity tank waste.

These funds will help support the on-going activities at the Horn Rapids Test Site for the integrated dryer and melter

test, Test 38D. This full scale integrated test is on schedule to validate resolution of Molton Ionic Salt (MIS) formulation and off gas filter performance.

CH2M HILL Hanford Group, Inc. (CH2M HILL), Pacific Northwest National Laboratory (PNNL) and AMEC Earth and Environmental, Inc. has addressed the MIS issue by successfully conducting several laboratory scale tests and three engineering scale tests to confirm the mechanism by which MIS

is formed and penetrates into the refractory.

Testing of the full scale dryer is being conducted in three phases: Phase 1 - *Subsystem Startup and Conditioning* and Phase 2 - *Soil and Water Drying* is completed. Phase 3 - *Glass Forming Minerals and Simulant Drying* will continue through the week of July 2, 2007.

Test 38D is required to address External Review Panel recommendations related to full-scale

integrated dryer/melt testing and is scheduled for mid-July.

CH2M HILL delivered the DBVS baseline documentation prior to the April 30, 2007, Environmental Management (EM) commitment date. The Office of River Protection then transmitted the documentation to EM. The completion of the baseline documentation also supports an External Independent Review (EIR) in June 2007 and Critical Decision-2 by late summer 2007.

Draft Hanford Facility Dangerous Waste Permit Public Review - Coming This Fall

Ecology will solicit public comment on the reissue of Hanford's dangerous waste permit in the fall. This new permit will have many similarities to the original "site-wide" permit issued in 1994, but there will be a number of important changes. These changes reflect new regulatory requirements, improved organization and clarity that will improve readability and assist Energy and contractors in complying with permit requirements.

The permit's structure is like an umbrella. Permit conditions in Parts I and II apply to all treatment, storage and disposal of dangerous waste across the facility. They are the rod of

the umbrella.

Part I has standard permit conditions common to all dangerous waste permits within the state of Washington, such as effect of the permit, duty to provide information, and reporting.

Part II has general facility conditions applicable to all of the Hanford Facility, such as facility recordkeeping, personnel training and closure. Parts III, V, and VI contain detailed requirements applicable to individual dangerous waste management units, including requirements for operations and closure. Part IV of the permit contains requirements to clean up

spills and releases from historical practices. These four Parts are the stays and fabric of the umbrella.

Part III has permit conditions for operating units. Part IV contains permit conditions for corrective action for releases from solid waste management units. Part V has permit conditions for units undergoing "closure," and Part VI has permit conditions for units that have closed, but long-term monitoring is necessary. Dangerous waste regulations require Ecology to reissue a permit after a fixed term, not to exceed ten years. Ecology issued the original permit for the full term of ten years. Hanford currently operates

under Permit version 8B.

The re-issue permit will be a brand-new permit, even though some elements are quite similar to the original permit issued in 1994. The document itself will be smaller. It will incorporate and bring up-to-date regulatory requirements that have changed in the past 10 years or that are necessary for the new permit.

When this permit goes out, there will be a LOT to review. Ecology will be accepting public comment on the entire re-issue permit document. Ecology expects the review will be in the fall and plans to hold a comment period of at least 60 days.

Saltcake, Liquids, and Sludge

Waste in Hanford's tanks is in three main forms: liquid, sludge, and "saltcake."

"Saltcake" means solid salts, which can be dissolved. Sludge are solids that can't be dissolved.

Liquid means...liquid. But at Hanford it's called "supernatant" and "interstitial liquid."

Supernatant means "floating on top," basically. And interstitial means, literally, the little spaces in a solid. The moisture in a sponge in your kitchen is interstitial liquid, for example.

In the 1980s and 1990s, Hanford workers pumped liquids from the single-shell tanks and put them into the double-shell tanks. This work was called "interim stabilization."

What remains in the single-shell tanks is mainly sludge and saltcake. There is a little bit (82,000 gallons) of liquid as well. The single-shell tanks store more than 88% of Hanford's sludge waste and more than 85% of Hanford's saltcake

The double-shell

tanks hold 99.6% of the supernatant. These tanks are newer and have not leaked.

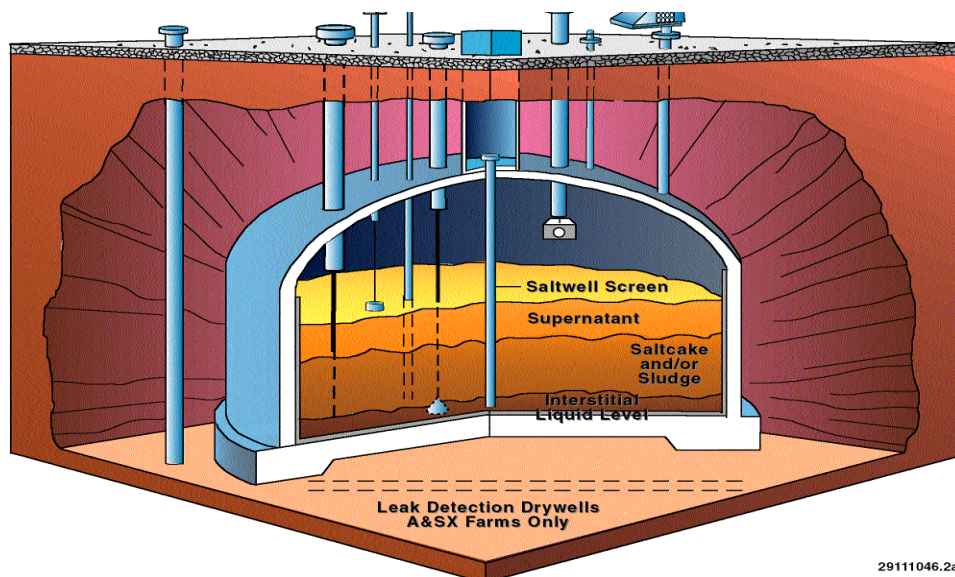
It may surprise you that the total amount of waste is more than 53 million gallons. But there is a good reason. USDOE has been emptying some of the oldest

single-shell tanks. This process increases waste volume.

They pumped out what liquid they could years ago, so what remains is sludge and saltcake. They remove saltcake by dissolving it in water. This increases waste volume. They remove sludge by blasting it with high-pressure liquid, and little pieces of the sludge are carried away in the stream. This is like when you have sand in the driveway and use a hose to move the sand away. Miners call this process sluicing. This also increases waste volume. Most of the liquids are in the double-shell tanks. Most of the solids (salt cake and sludge) are in the single-shell tanks. Most of the waste is salt cake and sludge and less than half is liquid.

in kgal	Supernatant	Sludge	Saltcake	Total
Single-Shell Tanks	82	9,849	19,964	26,519
Double-Shell Tanks	21,792	1,287	3,440	26,519
Totals	21,874	11,136	23,404	56,414

Source: HNF-EP-0182, Rev. 219; June 2006 report.



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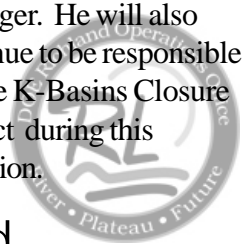
Organizational Changes at the Richland Operations Office

Mike Weis, Deputy Manager for the Richland Operations Office (RL), has been named the acting

RL Manager until a permanent replacement for the recently retired Keith Klein is selected. Dave

Brockman, senior Federal Project Director of the K-Basins Closure Project, will serve as acting Deputy

Manager. He will also continue to be responsible for the K-Basins Closure Project during this transition.



Working Safely at Hanford Recognized

On May 29, Department of Energy's Assistant Secretary for Environmental Management Jim Rispoli presented DOE's most coveted safety award, the Voluntary Protection Program's STAR, to Fluor Hanford's Soil and

Groundwater Remediation Project. The Voluntary Protection Program was implemented by DOE in January 1994 to promote safety and health excellence through cooperative efforts among labor, management and government. The

program offers three levels of recognition-STAR, MERIT and DEMONSTRATION- with STAR being the highest. Programs receive STAR recognition only after meeting rigorous standards, including demonstrated

injury and illness rates substantially lower than average. Throughout the complex, DOE has recognized 27 projects with the VPP STAR status, 13 of which are on the Hanford Site.

K East Reactor Basin Cleanout

On May 31, DOE met its commitment to state and federal regulators to complete movement of radioactive sludge out of the K East Reactor Basin, located about 400 yards from the Columbia River at the Hanford Site in Washington State. Commitments

under the Tri-Party Agreement among the DOE, Washington State Department of Ecology and U.S. Environmental Protection Agency (EPA) and to the Defense Nuclear Facilities Safety Board called for DOE to transfer all of the estimated 42 cubic yards

(32 cubic meters) of sludge out of the reactor's spent fuel pool by May 31.

Fluor Hanford began vacuuming sludge from the basin floor and consolidating it in underwater containers in the basin in October 2004, with the bulk of the work

finished last October. Workers developed specialized tools for vacuuming the sludge and removed some 170 tons of debris to make consolidating the sludge easier.



RCRA Permit Modifications

On May 9, 2007, the Department of Energy submitted a unit-specific portion of the Hanford Facility Dangerous Waste Permit Application for the 400 Area Waste Management Unit to Ecology. The 400 Area

Waste Management Unit has been storing mixed waste in the 400 Area under a Temporary Authorization. Ecology extended the Temporary Authorization through a letter on May 4, 2007. The Permit modification to

complete the Temporary Authorization process will be initiated as soon as possible in order to support permit issuance prior to expiration of the Temporary Authorization on November 10, 2007. This notice is provided in accordance

with Hanford Facility RCRA Permit Condition I.C.3, for Temporary Authorizations under WAC 173-303-830(4)(e)(ii)(C). Contact Greta Davis, Ecology at 509-372-7894 for further information about the Temporary Authorization and permitting process.

New Technology May Boost Efficiency of Groundwater Treatment at Hanford

The Department of Energy has begun field testing a new technology to significantly reduce groundwater contamination along the Columbia River Corridor.

DOE's Pacific Northwest National Laboratory and cleanup contractor, Fluor Hanford, are working together to develop a groundwater remedy that deploys a chemical, polyphosphate, into the groundwater. This chemical binds the soluble uranium found in the groundwater into an insoluble mineral called autunite and prevents it from migrating.

The approach is being tested in Hanford's 300 Area where during the production years, more than 20 million pieces of uranium fuel were fabricated for use in reactors. That production resulted in groundwater and soil contamination.

"Protecting the Columbia River is a top priority for the Department of Energy," said Acting DOE Richland Operations Manager Mike Weis. "Developing, testing and implementing innovative technologies is a key part of our strategy."

In field tests, the polyphosphate is injected through a well into the groundwater. The polyphosphate then mixes with the dissolved uranium within the groundwater, and binds it into the stable mineral form, autunite. In addition, the remaining phosphates combine with calcium to form the mineral "apatite," which binds contaminants such as uranium into a crystal structure. A similar technology is successfully being used in Hanford's 100-N Area to bind strontium-90 in place.

Initial results should be observable in nearby groundwater monitoring wells within a couple weeks of the final injection. Following the groundwater field tests, laboratory tests will be conducted to determine if the technology can be applied to deep soil contamination. Several other technologies are also being assessed and tested to determine their effectiveness on groundwater contamination. For more information on Hanford groundwater technologies, visit <http://www.hanford.gov/cp/gpp/>.

History, Curiosity Draw Public Tour Participants

Visitors boarding buses for public tours in June cited a variety of reasons for wanting to come to Hanford. Many said they were attracted by an interest in history — personal history for some, national history for most. Others admitted curiosity about seeing what was behind the gates they would normally not be allowed to pass.

The wife of a worker retired from Hanford commented, "I wanted to find out what my husband was talking about all these years." A past employee wanted to see the old

facilities. Another tour participant from Portland, Ore. added, "I wanted to see as much as possible before it is all gone."

"It was interesting," a participant from Bend, Ore. wrote on an evaluation sheet. "Better than visiting Hoover Dam."

"We wanted to see the actual sites where history was made," explained Melvin Hudson, who traveled with wife Laverne from Arlington, Texas. He is retired from the U.S. Air Force and she from the Social Security Administration. Back home, they operate a health information business. The

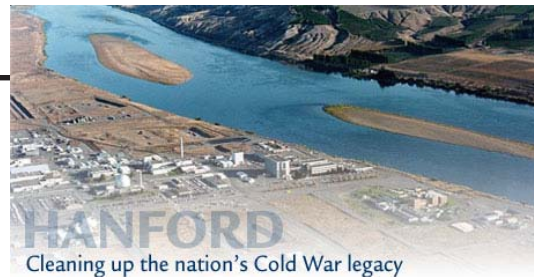
Hudsons earned recognition for traveling the greatest distance to join the 10 a.m. tour on June 14. The couple applied strategy to the computerized entry process: they were poised at their computer before registration opened at noon May 16, and then repeatedly tapped the "enter" key until they were rewarded with a successful application. On-line registration filled within one minute for the 250 seats on the six tours offered June 13 and 14 by the Department of Energy.

Richard Fettkether, Pasco, said his luck wasn't

good in getting a seat on the tour. "I've been trying for a long time," Fettkether reported. "For at least three years." An Iowa native, Fettkether lives in Pasco and describes himself as a history buff. His specialty is Lewis and Clark, and he has traveled much of their route on horseback and by canoe. He finds military history compelling, too. Fettkether said his own stint in the military inspired him to see Hanford. "I'm interested to see what's out here," he said.

Hanford Advisory Board News

Susan Leckband, Chair



The June Hanford Advisory Board meeting was very productive. It resulted in the issuance of four pieces of advice, one letter of congratulation and the unanimous selection of Rick Jansons as Vice Chair.

Advice #196 identifies some of the problems that current and former Hanford workers have had with the Department of Energy compensation program and its contractor (CCSI) for injured workers. The Board is pleased with the positive steps that have been taken by DOE to address worker concerns with the program and encourages DOE to continue a positive path forward. The Board also requested updates in the future.

With the ultimate value of protecting the Columbia River, the River and Plateau committee and the Board have done substantial work over the past 12 years on many issues affecting or having the potential to affect groundwater across the

Hanford Site. The most recent effort by the Board to clarify HAB and stakeholder values for the Department of Energy and the regulating agencies to consider when making decisions that affect groundwater is captured in Advice #197. The HAB requests that groundwater be cleaned up to its highest beneficial use and provided a flowchart that demonstrates how the agencies can apply stakeholder values to technical decision-making. The Groundwater flowchart was modeled after the Central Plateau Remedial Actions Flowchart issued last year (Advice #173) to help the agencies consider stakeholder values when determining waste site clean up actions across the Hanford central plateau. These flowcharts have been deemed very helpful by the regulating agencies and represent an excellent, collaborative effort between the agencies and the Board.

The Board has a longstanding tradition of providing advice on the Hanford budget and priorities. Advice #198 details Board values in budget terms. The Board

requests each year that adequate funding be provided to meet regulatory requirements and to ensure protection of the environment. Waste retrieval, groundwater remediation, tank farm operations (including tank retrieval), and remediation of underground plumes are some of the activities that the Board feels are not funded adequately in the proposed budgets.

In a separate budget-related advice, #199, the Board advised that baselines should reflect Tri-Party Agreement requirements, and that the public should have an opportunity to review and comment on any changes to those baselines.

Finally, the Board congratulated the Department of Energy, the Environmental Protection Agency, Fluor Hanford, Inc, and the K-Basin workforce for successful completion of sludge removal from the K-East Basin.

All of the above advice was generated in the Board committees and much thought and work went into

each piece. An extraordinary amount of information is reviewed and digested by Board members in order to develop meaningful advice for the Tri-Party Agencies. Each Board member contributes to the depth and breadth of the conversation that culminates in useful advice that captures Board and stakeholder principles. It's not an easy job to monitor the cleanup activities at Hanford and your Board members take their commitment to a cleaner Hanford very seriously.

Currently there is a Public-at-Large seat open on the Board. If you are a member of the public and would like to contribute to the Hanford cleanup through Board participation please contact the Washington State Department of Ecology 509-372-7954 or the US Environmental Protection Agency 509-372-8656 for an application.

I encourage you to view all of these documents and other information regarding the HAB by visiting the HAB website <http://www.hanford.gov/hab>.

Seventh Hanford Single-Shell Tank Retrieved

More waste removed from S-112 than all previous tanks combined

Field work to remove radioactive and chemical sludge and other solid waste material from single-shell tank S-112 has completed. This is the seventh waste retrieval project from a single-shell tank at the Hanford Site under the regulatory requirements of the Tri-Party Agreement. S-112 is a 758,000 gallon tank which was placed in service in 1952. At the time retrieval began, in September of 2003, the tank held over 614,000 gallons of waste. Several retrieval technologies were required over three-and-a-half years to meet regulatory requirements. Liquids were removed first using convention pumping techniques. Beneath the liquid was a thick layer of sludge which was removed using Modified Sluicing technology. Modified Sluicing used three nozzles

that spray water at a pressure of about 100 pounds per square inch, with a flow rate of about a hundred gallons per minute. This is slightly less than the pressure and flow rate of a fire hose. The water dissolved much of the waste, allowing it to be easily pumped. Some of the remaining solids were broken up by the water and they too, were pumped from the tank.

When the limits of the modified sluicing technology were reached, a hardened layer of waste remained at the bottom of the tank known as the "heel." This layer included about 23,000 gallons of solids that would not yield to conventional retrieval techniques.

The Salt Mantis was inserted into the tank as a demonstration project to

see if the technology would work to break up and mobilize the hardened material at the bottom of the tank. The technology uses extremely high pressure water (35,000 pounds per square inch) at a very low flow rate (just 5-6 gallons per minute) to blast the hardened material into small bits. It performed beyond expectations and effectively broke up all of the material it could reach and helped mobilize it so it could be pumped out of the tank. When the limits of that technology had been reached, only about 2,400 gallons of residual waste remained in the tank, well below the 360 cubic foot limit established by the Tri-Party Agreement.

Removal of the waste from tank S-112 is part of an aggressive program initiated by the

Department of Energy's Office of River Protection and CH2M HILL to remove liquids, sludges and saltcake waste from Hanford's 149 underground single-shell tanks and transfer the waste to newer, double-shell tanks where it will be safely stored until it can be prepared for treatment and disposal. CH2M HILL will continue to investigate and demonstrate new retrieval technologies to be deployed at future tank retrievals.

CH2M HILL is a prime contractor to the Department of Energy's Office of River Protection (ORP) and is responsible for safely managing 53 million gallons of radioactive and chemical waste stored in 177 underground tanks. The 586-square-mile Hanford Site is located in south-central Washington State.

Home Plate from Hanford's Construction Camp Discovered

As part of the Washington Closure Hanford Mission Completion project, workers have been conducting evaluations to identify potential waste sites or "orphan sites" in the river corridor that are not presently included in the cleanup plans. Piles of debris, stained soil, or depressions in the ground

may indicate areas that merit identification as an orphan site followed by characterization and potential cleanup.

Workers are presently conducting field investigation of the 100-IU-6 operable unit, which includes the former Hanford construction camps. A 30m

conceptual grid was established and hand-held global positioning system units are used to guide three person teams and record data from a systematic walkdown of the grids. The field team has an idea of what to expect from a review of historical documents, drawings, and photos that are conducted

before the field work begins. To date, Washington Closure Hanford has covered more than 5500 of the planned 7000 acres as part of the 100-IU-6 field investigation.

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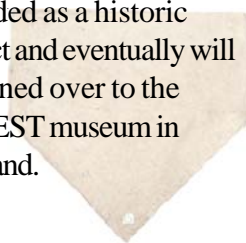
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Something workers did not expect to find during the 100-IU-6 investigation was a rubber home plate from one of the original 1940s era construction camp ball fields, which is now

covered in a sea of yellow cheat grass. Behind it were the wooden remains of a backstop lying on the ground and a sagebrush that has grown nearly 6 ft tall. The Hanford

construction camp included two baseball fields and nine softball fields. The main baseball field had bleacher seating for more than 4,000 people.

The home plate will be recorded as a historic artifact and eventually will be turned over to the CHREST museum in Richland.



Hanford Update

The Hanford Update newsletter provides general information about Tri-Party Agreement cleanup and compliance activities. The newsletter also contains information on public meetings, workshops, and other opportunities to participate in Hanford Site decisions. The newsletter is available on the Internet at www.hanford.gov/tpa/updates.html.

Hanford Cleanup Line: 1-800-321-2008

Summer 2007



U.S. Department of Energy
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